

Wiggling Worms

Overview Students will keep a record in their journals of questions about earthworms, observations of their adaptations, and results of an experiment. They will use this knowledge as they set up a class vermicompost bin.

**Lesson
Planner**

Time Required	95 minutes
Key Concepts/Terms	Head, saddle, tail, segments, bristles, castings, adaptations, vermicompost
Prerequisites	<ul style="list-style-type: none">• Knowledge of expectations for outdoor classroom conduct.
Setting	<ul style="list-style-type: none">• 10-minute field study outside• Remainder of lesson inside

Standards MDSC 3rd Grade Science

3.B.1. Explore the world of minute living things to describe what they look like, how they live, and how they interact with their environment.

Objectives Students will listen to a read-aloud about worms and observe worms in order to identify the structures of a worm that help it to survive and to change its environment.

**Materials
Required**

- *Diary of a Worm*
 - Hand lenses
 - Plates/paper towels to put worms on
 - Worms (preferably red wigglers for worm bins)
 - Bin
 - Food scraps
 - Copies of modified worm journal (with vermicomposting on page 3)
 - Metric ruler
 - Tools for digging outside (spoons, trowels, shovels, etc.)
 - Containers to bring worms inside from outside
 - (optional) Copies of quiz
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Background Information

Page 81 from *More Picture-Perfect Science Lessons* has excellent background information on worms.

Procedure

Follow the steps in the table below to conduct the activity. **Sentences in bold are suggestions for what teachers might say to students.** *Items in italics are possible teacher answers to questions.*

Phase	Step	Action
Engage	1	<u><i>Diary of a Worm</i> Read Aloud</u> (20 minutes) Have you ever kept a diary or journal? What are some things people include in diaries and journals? Read <i>Diary of a Worm</i> to students. While reading, use the Questioning the Author strategy as suggested in <i>More Picture Perfect Science Lessons (MPPSL)</i> on page 82.
Explore	2	<u><i>My Worm Journal</i></u> (10 minutes) Have students complete the cover and second page of their worm journal. (see pages 82-83 of <i>MPPSL</i>) For the section for “My Own Worm Wonderings,” let the students know we will be going outside to see if we can observe worms in their natural environment. Lead them to choose one “I wonder...” statement about observing the worms outside. For instance, “Do worms like cold weather?” or “Will there be worms after a rainstorm?” Students may choose any other second wondering of their choice.

Explore	3	<p><u>Introduction to Outdoor Learning (10 minutes)</u></p> <p>If students are unfamiliar with using the schoolyard as a classroom, begin by creating a concept map or making a list together as a class to go over rules and expectations for learning outside.</p> <p>Have in mind some expectations for outdoor learning specific to your schoolyard that you want to be sure students include. For instance,</p> <ul style="list-style-type: none"> • <i>Regular school rules still apply (respect each other, listen to the speaker, follow directions, etc.)</i> • <i>No yelling, screaming, tapping on/waving into windows that will disrupt class learning inside the school building.</i> • <i>“Look, learn, and let go” when you see insects.</i>
	4	<p><u>Directions (5 minutes)</u></p> <p>When outside, we will be looking in the soil to find worms. With older students, they can compare different sites outside – are there more worms in the field or forest?</p> <p>We will need to fill back in any holes that we dig.</p>
Explore	5	<p><u>10-Minute Field Study</u></p> <p>Bring students outside. Keep track of the time, giving students ample warning for when it’s time to head back in. Allow students to use tools, such as spoons or trowels, to dig for worms. Be sure to fill in any holes that are dug. Students should be able to bring worms back inside to study.</p>

<p style="text-align: center;">Explain</p>	<p style="text-align: center;">6</p>	<p><u>Worm Observations</u> (15 minutes)</p> <p>Once back in the classroom, have students follow the directions on page 2 of their journals to make observations of a worm per pair. They may either observe a worm they found outside or a worm that you provide them. They will need a hand lens, ruler, and plate or paper towel to place the worm on.</p> <p>Once the observations are completed, go back to page 1 of the journal to see what questions students have found answers to.</p> <p>Discuss with students what an adaptation is. Then, discuss what adaptations worms have.</p> <p>More guidance for this can be found on pages 83-85 of <i>MPPSL</i>.</p>
<p style="text-align: center;">Elaborate</p>	<p style="text-align: center;">7</p>	<p><u>Vermicompost Bin</u> (10 minutes)</p> <p>We are going to raise worms in our classroom that will be able to turn some of our food scraps into soil. This is called vermicompost.</p> <p>What would worms need to live successfully in a bin? If we were to design our own new bin, what would they need?</p> <p>Worms need:</p> <ul style="list-style-type: none"> • Water (enough to keep the pile damp) • Air (they get enough from the space between the lid and the bin) • Warmth (they can't last through freezing) • Dark (they don't like light) • Food

Elaborate	8	<p><u>Vermicompost Bin</u> (10 minutes)</p> <p>What kind of food can we give worms?</p> <p>Pass out word cards with the items listed on page 3 of the journal. Have students sort the cards into piles of what can and cannot be added to the worm bin.</p> <p>Go over the correct answers, and have students circle the items that CAN go in the worm bin (no dairy or meat – any paper products should be torn).</p> <ul style="list-style-type: none"> • Apple core • Eggshells • Sandwich crust • Newspaper • Tea bag • Leaves • Rotten banana • Paper bags • Coffee grounds • Orange peels • Paper napkins • Rice
Evaluate	9	<p><u>Student Responses</u> (5 minutes)</p> <p>Score students' completion of page 4 of their journals. OR, give students the first page of the Wiggling Worms Quiz on page 97 of <i>MPPSL</i>.</p> <p>Don't forget to bring any worms that students found outside back outside. If the worms were found deep underground (for instance, if it's cold outside) be sure to put them back underground that deep so they can survive the cold weather.</p>

Vocabulary

Understanding of the following terms is required in this activity.

Term	Definition
Head	Front end of the worm; where the mouthpart of a worm is.

Saddle	The thickened part of a worm, about 1/3 of the way from the head, used for sexual reproduction.
Tail	Back end of the worm, where it gets rid of waste.
Segments	Individual sections of the worm's body; the first is the head, the last is the tail.
Bristles	Small hairs on each segment that act like little legs.
Castings	Worm droppings.
Adaptations	Body parts or behaviors that help an animal meet its needs.
Vermicompost	When worms assist in breaking down food scraps into organic compost that can be used to enrich soil.

Adapted from "Wiggling Worms" found in *More Picture Perfect Science Lessons* by Christa Haverly



Apple Core	Tea Bag	Plastic Bag
Steak	Pepperoni Pizza	Coffee Grounds
Eggshells	Leaves	Orange Peels
Sandwich Crust	Rotten Bananas	Paper Napkins
Newspaper	Paper Bags	Rice

Vermicomposting: Worms in Your Classroom

On the list below, circle the items that CAN go in the worm bin:

- | | | |
|----------------|-----------------|----------------|
| Apple Core | Tea Bag | Plastic Bag |
| Steak | Pepperoni Pizza | Coffee Grounds |
| Eggshells | Leaves | Orange Peels |
| Sandwich Crust | Rotten Banana | Paper Napkins |
| Newspaper | Paper Bag | Rice |

Imagine a world without worms. What would change? How would it affect the ecosystem?

The above is intended to be literally cut and paste onto page 3 of the worm journal from *MPPSL* page 93.